CHINA Aluminum INDUSTRY:

A NICE FUTURE OR A BUMPY ROAD AHEAD?
Part One

CHINA ALUMINUM STORY SO FAR
Production struggle to beat past highs, but growth to slowdown after 2011

**Primary aluminum**

<table>
<thead>
<tr>
<th></th>
<th>output</th>
<th>YoY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015(1-8)</td>
<td>21.07 mln t</td>
<td>12.2%</td>
</tr>
<tr>
<td>2015e</td>
<td>32 mln t</td>
<td></td>
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</tbody>
</table>

**Alumina**

<table>
<thead>
<tr>
<th></th>
<th>output</th>
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<tbody>
<tr>
<td>2015(1-8)</td>
<td>37.87 mln t</td>
<td>11.5%</td>
</tr>
<tr>
<td>2015e</td>
<td>56 mln t</td>
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</tbody>
</table>
Chinese growth push global production to trend

**Alumina: Jan to Aug, 2015**
- China/Global = 50.2%
- China growth rate = 12%
- ROW growth rate = -2.9%

**Primary aluminum: Jan to Aug, 2015**
- China/Global = 54.7%
- China growth rate = 12%
- ROW growth rate = 2%
The up-trend of Secondary aluminum output stay steady

- Secondary aluminum accounts for 20% of primary aluminum;
- Domestic recycling keep on increasing, CAGR is 24%.
Semis output grow rapidly, especially extrusion.

- From Jan to Aug of 2015, semis output is 33.5 mln t, +9.13%;
- The share of extrusion doubled to more than 60%.
Aluminum trade in surplus

- Value of import resources (bauxite & alumina)
- Value of export aluminum and processed products
Imported resources account for about 50% of the total demand

- Making use of markets at home and abroad, and two resources (bauxite and alumina)
- A moderate amount of imported resources are likely to remain, with two resources complement each other
Import bauxite sources are more plentiful

- A full ban being placed on Indonesian bauxite exports from 12th January 2014.

![Chart showing bauxite sources]

- Indonesia: 91%
- Australia: 40%
- Malaysia: 38%
- India: 14%
- Other:
Primary aluminum industry focus on domestic needs

- Export: Imposed 15% tariff
- Import: Depend on the price difference at home and abroad
- Net import or export account for less than 2% of output, with a small volume of import and export trade
Semis consumption mainly depends on domestic market

- Since 2005, semis turned to be net-export
- Jan to Aug in 2015:
  - semis exp: 2.87mln t, +31%
  - semis imp: 316ths t, -3%

Net export accounted for less than 10% of output
The growth curves in aluminum consumption look certain to continue.

- CAGR of primary aluminum apparent consumption is 16% during the last 15 years, more than the aluminum output and GDP growth rate.
Structure of aluminum End Use is adjusting

- Construction still to be the largest segment;
- Transportation consumption is moving up on the trend.

![Pie charts comparing aluminum end use in 2007 and present.](image-url)
Facility upgrade & Energy consumption come down

600kA

≥500kA

≥400kA

≥300kA

Smelter cells

[Graph showing energy consumption trends over years]
WHAT THE FUTURE HOLDS?
China's “New Normal”

- The gear of growth is shifting from high speed to medium-to-high speed.
China aluminum industry under the new conditions

- Al price is continuing to fall
- Growth in investment is sluggish
- Over-capacity
- Plenty of resources demand
- No sign of international markets significantly pick up
- Major domestic consumption fields all in a declining rate
- Power price is high

Difficulties and challenges on the road ahead
Domestic resources consuming rapidly

- China bauxite reserve rank 8th, account for about 3% of the world;
- China bauxite exploitation rank 1st, account for nearly 30% of the world.
Speed up the pace of international cooperation in resources development

- West Africa and South America would become China’s main sources of bauxite
- Resources will not be a bottleneck of China’s aluminum industry development

**Cooperation overseas**

- Fiji—Xinfá
- Indonesia—Hongqiao, Nanshan
- Guinea—Hongqiao
- Guyana—Bosai
- Laos—Yunnan Aluminum
- Ghana—Bosai
- ……

— Obtain overseas mining rights
— Exporters
Primary aluminum overcapacity will be settled under market mechanism

- It’s a periodic overcapacity

- Aluminum price sharply down, and no sign of rally
- Except for 2009, SHFE spot price breaks 20-year. Where is the bottom?

- From Jan to Aug, 2015, loss 1.9 billion yuan.
- High profits for primary aluminum industry has become a history & will be in a state of small profit over the long term
Primary aluminum overcapacity will be settled under market mechanism

- Investment began to decrease from 2013
- From Jan to Aug, 2015, investment is 34.8 billion RMB, decreased by 1.9% Y-O-Y.
Trimming costs while whittling down power price

Cost composition of primary aluminum

- Power: 39%
- Al₂O₃: 41%
- Anode: 14%
- Others: 6%

- Reduce energy consumption

- Build power plant

Primary aluminum capacity in two power modes

- Power from State Grid
- Power from self-provided

<table>
<thead>
<tr>
<th>Year</th>
<th>Power from State Grid</th>
<th>Power from Self-provided</th>
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<tbody>
<tr>
<td>2013</td>
<td>47%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>63%</td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>72%</td>
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</table>
China smelters competitiveness is improving

- As coal prices fall, smelters costs should fall too as the cost of generating costs falls.

- The Reform of China's Electric Power System will have positive impact on aluminum industry.
China's aluminum consumption growth space is huge

- **Developed countries or regions**: After peak passed, al-consumption remain a stable level.

- **China**: The peak of al-consumption has not yet appeared.
  - Per capita consumption level is relatively low, still has room to grow
  - Stock level is relatively low, still accumulating rapidly
China: Aluminum consumption will maintain steady growth since the next four or five years. It is expected the peak would appear after 2020.

China's aluminum consumption growth space is huge
Growth is mainly in three respects

Mature markets

Emerging markets

Widely used abroad, fewer in China
Mature markets

Engine
Heat exchanger
Gearbox

......
It is projected to add greatly to China’s aluminum demand.

- Formwork
- Roof & wall plate
- Overcrossing
- Flood wall
- Trailer
- Coal wagon
- Electric bus
- Auto body sheet
- Tray
- Beverage can
- Beer bottle
- Cable
Emerging markets

- Aluminum-air battery

- Used for Sea water desalinization

- ......
Predictions

**Production**
- Output growth rate will slow down
  - Investment of alumina & primary aluminum have decreased since 2013
  - Investment growth rate of aluminum semis dropped significantly

**Consumption**
- As China's rural and urban areas and various regions are enormous, domestic demand will generate great potential of aluminum consumption growth

**Acquisitions & reorganizations**
- Acquisitions & reorganizations are speeding up
  - Sufficient material backup: overcapacity
  - Motivation: large difference between enterprises profit.
  - Average scale still small: smelter(400 thousand tons); processing plant(30 thousand tons)
Thank you!

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